

Remarks

The Office Action dated April 8, 2009, has been received and carefully reviewed. The preceding amendments and the following remarks form a full and complete response thereto. Claims 1 and 6 have been amended. Support for these amendments can be found, inter alia, in paragraphs [0010], [0024] and [0052] and the original claims. No new matter has been added. Claims 7-50, 54, 57, 60, 64, 66-67 and 69 are withdrawn. Claims 1-6, 51-53, 55-56, 58-59, 61-63, 65 and 68 are pending in the application, for which reconsideration is earnestly requested.

In the Office Action, an objection was made to claims 1-6, 51-53, 55-56, 58-59, 61-63, 65 and 68 because of informalities. In claim 1, upon which claims 2-6, 51-53, 55-56, 58-59, 61-63, 65 and 68 directly or indirectly depend, the phrase "can be" was alleged to render the claim problematic because it is not certain whether the limitations following the phrase are part of the claimed invention. Claim 1 has been amended to state "~~can be~~ is to be moved to different positions." Further, claim 6 was objected to because there is allegedly insufficient antecedent basis for "the help" and "the coordinates." Claim 6 has been amended to state "with ~~[[the]]~~ a help of ~~[[the]]~~ coordinates it is determined ..." Accordingly, Applicant requests that the objection be withdrawn.

Claims 1-2, 51-53, 55-56, 58-59, 61-63 and 65 were rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by Takahashi (JP 09-230122A). Applicant respectfully traverses the rejections and submits that Takahashi fails to disclose each and every feature of claims 1-2, 51-53, 55-56, 58-59, 61-63 and 65.

Prior to addressing the particular merits of the rejection with respect to specific claim limitations, Applicant believes that it would be helpful to further explain, in general, salient features of the present invention. The present invention relates to creating grating lines. The grating lines are to be written by deflecting a particle (ion or electron) or light beam. Since the maximum deflection of the beam does not cover the whole grating field composed of grating lines, a moveable sample holder is required in addition. According to the prior art, the grating field is split into single raster elements independent of the motif displayed. Within the screen elements, the grating lines are written by deflecting an electron beam, whereas the movement from screen element to screen element is performed using the moveable table. However, this has the disadvantage that grating lines that fall into several raster elements are composed of several partial segments. The partial segments are respectively written by deflecting the particle or the light beam, which can cause knicks and gaps of the grating lines.

In order to overcome this disadvantage, the present invention selects at least one grating line that lies entirely within one so called working field of the writing apparatus and has a size predetermined by the deflection of the beam. Then, a sequence of possibly overlapping working fields is defined, in which the selected grating lines are written entirely and without interruption by deflection of the beam in a continuous writing process. Thereafter, these working fields are moved by the aid of a moveable sample holder and the individual grating lines are written continuously and entirely by deflecting the particle or light beam.

Claim 1, upon which claims 2, 51-53, 55-56, 58-59, 61-63 and 65 directly or indirectly depend, recites a method for producing a grating image, which at least has one grating field with visually recognizable, optically variable properties, in which grating lines are disposed. The grating lines are produced by means of a writing apparatus. The working apparatus has a working field with a fixed size predetermined by a deflection of a particle beam or a light beam of the writing apparatus. The working field can be moved to different positions of a substrate to be inscribed. The method includes determining at least one uniform grating line that completely lies within one working field and defining a sequence of working fields with respect to the grating field. In each of the working fields at least one grating line is to be produced continuously without interruption along its entire length by means of deflection of the particle beam or the light beam of the writing apparatus. The method further includes moving to the working fields by relative movement of a carrier, on which is located the substrate, and the writing apparatus, and writing the at least one grating line into the substrate with the writing apparatus within the respective working fields.

Takahashi discloses a diffraction grating pattern 18 with a dot 16 as a unit which is plotted by an electron gun 50. The diffraction grating patterns 18 are plotted, dot by dot, by moving the X-Y stage 20. (English Abstract of Takahashi.) Dot data are inputted to the computer to determine the pitch of the diffraction gratings so as to reproduce the colors of the dots. The direction and curvature of the diffraction gratings are determined and the plotting of the diffraction gratings of the dots is executed to complete the plotting.

The pitch at which the dots are arranged in these diffraction grating patterns 18 is specified to ≤ 0.1 mm.

Takahashi fails to disclose producing a grating line by means of deflection of the particle beam or light beam of the writing apparatus. In particular, there are no clear statements in Takahashi about parts of a grating pattern being written by deflecting a beam.

Further, Takahashi fails to disclose determining at least one uniform grating line that completely lies within one working field which has a size predetermined by the deflection of a particle beam or light beam. Firstly, Takahashi fails to disclose a working field with a size predetermined by the deflection of a particle or light beam of the writing apparatus. In particular, the size of the “dots” of Takahashi is not predetermined by the deflection of a beam of the writing apparatus. Further, Takahashi fails to disclose a deliberate selection of at least one uniform grating line that entirely lies within one field or “dot.” In particular, Takahashi’s dots may contain continuous grating lines, which extend over several dots, such grating lines can even be found in Figures 2, 5 and 6 of Takahashi.

Further, Takahashi does not disclose defining a sequence of working fields with respect to the grating field. Takahashi fails to disclose defining a sequence of working fields optimized for the grating field, which has a size predetermined by the deflection of a particle or light beam, can overlap with other grating fields and in which the grating lines are produced continuously along their entire length by deflection of the particle beam or light beam. In particular, the patterns shown in Figs 2, 5 and 6 of Takahashi

contain continuous lines that extend over several dots. Since the dots of Takahashi are written sequentially, as confirmed in the Office Action, the grating lines are not written entirely and without interruption.

Accordingly, for at least the foregoing reasons, Applicant submits that the rejection is improper and requests the rejection of claims 1-2, 51-53, 55-56, 58-59, 61-63 and 65 be withdrawn.

Claims 3-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi in view of Jackson et al. (U.S. Patent No. 5,335,113) ("Jackson"). Applicant respectfully traverses the rejection and submits that the combination of the cited prior art fails to disclose or suggest each and every feature of claims 3-6.

Claims 3-6 depend indirectly from claim 1. As already discussed, supra, Takahashi fails to disclose each and every feature of claim 1. Jackson fails to remedy the above-identified deficiencies.

Jackson discloses diffraction gratings of reflective or transmissive lines formed by a regular matrix of pixels each containing at least a respective curvilinear portion of one or more of said lines. Jackson fails to disclose producing a grating line by means of deflection of the particle beam or the light beam of the writing apparatus or determining at least one uniform grating line that completely lies within one working field which has a size predetermined by the deflection of a particle or light beam. The combination of Takahashi and Jackson fails to disclose or suggest each and every feature of claim 1. Claims 3-6 depend indirectly from claim 1 and include the features of claim 1 that are not disclosed or suggested by Takahashi and Jackson. Therefore,

Takahashi and Jackson fail to disclose or suggest each and every feature of claim 3-6 for at least the foregoing reasons. Accordingly, Applicant submits that the rejection is improper and requests the rejection of claims 3-6 be withdrawn.

Claim 68 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi in view of Lee (WO 91/03747 A1). Applicant respectfully traverses the rejection and submits that the combination of the cited prior art fails to disclose or suggest each and every feature of claim 68.

Claim 68 is a product-by-process claim that indirectly refers to the steps of claim 1. As already discussed, supra, Takahashi fails to disclose or suggest each and every feature of claim 1. The method disclosed in Takahashi is substantially different from the present invention and would yield a different product. The present invention yields a transfer material with continuous, uninterrupted grating lines. Takahashi discloses a method that produces a product with kinks or gaps in the grating lines because the grating lines are not produced continuously and uninterrupted. Lee fails to remedy the above-identified deficiencies. Lee discloses a method of forming a diffraction grating which provides an optically variable image. Lee fails to disclose producing a grating line determining at least one uniform grating line that completely lies within one working field which has a size predetermined by the deflection of a particle or light beam. The method disclosed in Lee will produce a product with kinks or gaps in the grating lines. The combination of Takahashi and Lee fails to disclose or suggest transfer material with continuous, uninterrupted grating lines. Accordingly, Applicant submits that the rejection is improper and requests the rejection of claim 68 be withdrawn.

In view of the above, all objections and rejections have been sufficiently addressed. Applicant submits that the application is now in condition for allowance and requests that claims 1-6, 51-53, 55-56, 58-59, 61-63, 65 and 68 be allowed and this application passed to issue.

In the event that this paper is not timely filed, the Applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account No. 02-2135.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

Respectfully submitted,

/Brian A. Tollefson/
Attorney for the Applicant
Brian A. Tollefson
Reg. No. 46,338
ROTHWELL, FIGG, ERNST & MANBECK
1425 K Street, N.W.
Suite 800
Washington, D.C. 20005
(202) 783-6040